Section I

Q2 (b)

Energy conservatism

Energy conservation is a method to store and consume energy effectively to use it for a longer period of time.

1. Measures for Energy Conservation

a) Behavioural changes

To conserve energy, one needs to change its behaviour patterns. For example switching off electric appliances that do not require constant energy supply is an effective measure.

b) Optimization and efficiency

Use of energy in industry and for domestic use needs to be optimized by minimizing energy losses. For example, quality transmission lines can protect energy losses while energy transmission through the grid.

c) Technological Advancement

Energy sustainability demands advanced technology that helps in effecting minimizing energy consumption. For example, using LED lights and instead of bulbs.
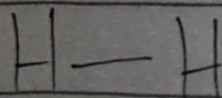
d) Renewable energy resources

The most efficient and effective sustainable solution for energy conservation is using renewable energy resources.

Q2 (c)
Hydrogen bonding

Hydrogen bonding is a type of single covalent bond in which valence electron share one or more electron for their stability

Structure of Hydrogen Bonding

$$H-H$$

Characteristics

a) **High melting point**

Hydrogen bonding has high melting point but less than ionic bonds.

b) **Electrical properties High solubility**

These bonds have high solubility that are easily dissolved in water.

Q3 (b)

Tsunami

Tsunami is a natural hazard created by the disturbances in large water bodies mostly oceans. Tsunamis result in creation of large waves with wavelength upto 100 miles and travelling speed of 500 - 900 km.

Generation of Tsunamis

a) Earthquake under water

Tectonic shift in plate

both with regard to subduction
or divergent result in seismic wave
propagation in water body. These
waves further propagate the
process of Tsunamis in the form
of water waves.

b) Volcanic Eruptions
When Thick Magma explodes
under water it creates a sudden
pressure on surrounding water bodies.
This pressure results in the propagation
of Tsunamis.

c) Collapse of coastal bodies.
Sudden collapse of large
coastal body and sedimentation
changes the movement of water.
Large amount of sedimentation is
enought to generate wave structure
to generate Tsunamis.
Recent example
October Tsunami in Japan 2024

Q3 (c)
Environmental pollution

Environmental pollution refers to the waste that effects biosphere and biodiversity of Earth.

Harmful effects

a) Human Health

Loss of pure water due to the contamination with waste material effects human health severely. Severe diseases like polio emerge from such harmful affects.

b) Groundwater leeching

Use of fertilizers for the growth of plants is essential. When this chemical is used in excessive amount it results in leeching which contaminate water body and result in eutrophication.

c) Contamination of water

When industrial wastes are released in water bodies, it results

in the loss of living organisms
under water due to the increased
acidity.

Measures to curb it

a) Raising Awareness

Raising awareness and educating
people regarding the use of chemicals
that result in pollution is an effective
solution.

b) Land disposal

Proper land disposal to
dump the land waste can
help in reduction of pollution which
can ultimately help in human health.

c) Industrial waste disposal

Implementation of laws and
regulation with regard to industrial
waste being released in water. This
can prevent water contamination
of helping water bodies to survive.

Q6
(a)

$$a + b + c = 15 \quad \text{---(i)}$$
$$b + c = 12 \quad \text{---(ii)}$$
$$c - b = 2 \quad \text{---(iii)}$$

Adding (i) and (ii)

$$c + b = 12$$
$$\underline{c - b = 2}$$
$$2c = 14$$
$$c = 7$$

Put c in (ii)

$$b + c = 12$$
$$b + 7 = 12$$
$$b = 12 - 7$$
$$b = 5$$

Put c and b in (i)

$$a + 5 + 7 = 15$$
$$a = 15 - 12$$
$$a = 3$$

Three digit number is 357

Q6

(c)

$d = 6$ cm

$r = \dfrac{d}{2} = \dfrac{6}{2} = 3$ cm

$C = 2\pi r = 2(3.14)(3)$

$\quad = 18.84$ cm

$A = \pi r^2 = (3.14)(3)^2$

$\quad = 28.26$ cm

Q6(d)

1) 13, 24, 46, 90, 178, ___

Difference of

11, 22, 44, 88

Numbers are adding themselves

$88 + 88 = 176$

To find sixth number add 176 and 178

13, 24, 46, 90, 178, $\boxed{354}$

Q8

(a)

$l = 15$ ft

$w = 0.6 l$

$w = 0.6 \times 15 = 9$ ft

~~Area of rectangle~~

The dimensions of room are

Length $= 15$ ft

Width $= 9$ ft

Q8 (c)

Total students $= 40$

First average $= 52.15$

First total marks $= 52.15 \times 40 = 2126$

Subtract 49 and 85 in 2126

$2126 - 49 + 85 = 2162$

New total $= 2162$

$Avg = \dfrac{\text{Total marks}}{\text{no. of students}} = \dfrac{2162}{40} \quad {}^{270.25}$

$Avg = 54.05$

Q8(d)

People like vegetable = 37

People like chicken = 25

people like neither = 3

Total = 65

Probability of people who like

chicken pizza = $\dfrac{25}{65}$ = $\dfrac{5}{13}$